



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: John J. Walsh, et al.
Appl. No.: 10/158,529
Filed: May 29, 2002
Title: "Standalone Ignition Subassembly for Detonators"

Group/A.U.: 3641
Examiner: Bret C. Hayes

Docket No.: BRI/002

DECLARATION UNDER 37 C.F.R. § 1.132

I, Abrar A. Tirmizi, do declare and state as follows:

1. All statements herein are made based on my own personal knowledge except where it is indicated that a statement is based on information and belief. All statements made of my own knowledge are true, and all statements made on information and belief are believed to be true.
2. I am an inventor listed on the above-identified patent application ("this patent application"). I am a staff Senior Packaging Engineer at Special Devices and have worked in the pyrotechnic industry for about five years, including almost the last three years on Special Devices' electronic detonators. I hold a B.Sc. in Applied Physics from the University of Karachi (1979), a B.S. in Mechanical Engineering from the University of Texas (1985), and an M.S. in Engineering Management from California State Northridge (1991).
3. I am familiar with U.S. Patent No. 6,079,332 to Marshall et al. ("Marshall") and U.S. Patent No. 5,988,069 to Bailey ("Bailey"). Marshall is analogous art to the subject matter claimed in this application, but, though it is cross-referenced to the same class as Marshall, Bailey is not analogous art to this application. Bailey is directed specifically to an automotive airbag initiator, which art is not analogous to detonators such as claimed in this application, which are used in blasting and mining. Persons of ordinary skill in the detonator art would not have, at the time of the invention of this application, considered or referred to technology in the automotive initiator field to address problems in or modify the designs of, detonators. To the contrary, technical conferences in the detonator field are separate from, and do not overlap with, technical conferences in the automotive initiator field. Similarly, those skilled in the design and manufacture of initiators would generally not have a background in mining or the pyrotechnic products used therein. The technical issues are quite different, and automotive initiators are not pertinent to the problems involved in detonator design. The design of electronic detonators is approached completely differently, and involves vastly different considerations. One reason for the difference in design strategies between detonators and automotive initiators is that in detonator systems, all detonators are intended to deploy – every single one on the system – in response to a single signal; in contrast, only one or a selected small number of initiators are intended to deploy in response to a signal. Another reason for the difference is that, on the other hand, the manufacture and assembly of the structural and pyrotechnic components of detonators is in general more "low-tech" and often relies upon hand-assembly, whereas initiator manufacture tends to be highly automated and focuses intensively on extremely high reliability.

4. In addition to being non-analogous art, there was no suggestion or motivation existing at the time of the present invention to modify the teachings of Marshall with Bailey by substituting the hermetically sealed automotive initiator of Bailey for the ignition element of Marshall. To the contrary, one of ordinary skill in the detonator art would have been clearly led away from such a modification for a number of reasons, including those set forth in the preceding paragraph. Further, providing a hermetically sealed initiator in a conventional fashion requires circumferential welds. To fit in a standard detonator shell, however, an ignition element must have a significantly smaller diameter than automotive initiators, resulting in a significantly higher surface to volume ratio and concomitantly reduced heat-sink for the heat generated by welding, presenting a well-known impediment to the welding of such devices. Further, reducing the header of Bailey proportionally results in problems of insulator glass-cracking during welding. For these and other reasons, even if one of ordinary skill in the detonator art had considered the (non-analogous) Bailey patent, he would have been led away from using its teachings to modify a detonator to incorporate a hermetically sealed ignition element. Finally, there was no motivation for one of ordinary skill in the art to make such a combination because there was no recognition of the applications and benefits that would follow from the provision of a hermetically sealed ignition element (along with an encapsulated body) in a detonator. As explained by the Applicant in the present application, those benefits include the ability to handle and transport detonator electronic ignition subassemblies *apart from* detonator shells and charges, which in turn provides many potential advantages in the use and interchangeability of electronic detonators.

5. I understand that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. § 1001), and may jeopardize the validity of this patent application or any patent issuing thereon.


Abrar A. Tirmizi

Date: March 15, 2004